Claims

1. A method for observing and measuring the lateral environment of a vehicle, mainly for detecting parking spaces, wherein digital images are recorded by means of a camera, provided with a time stamp and buffered,
characterized in that the vehicle's own movement is sensed in order to select image pairs from the buffered images on the basis of this data,
wherein the position and orientation of the camera which are present at the two recording times are determined,
and in that a local 3D depth image is generated on the basis of the image pairing by means of an algorithm for stereoscopic image processing, wherein the position and orientation of the camera at the recording times are taken into account within the scope of a synthetic stereoscopic geometry.

2. The method as claimed in claim 1, characterized in that the vehicle's own movement is sensed, in particular on the basis of the speed, the number of revolutions of the wheel, navigation information or data from vehicle movement dynamics systems.

3. The method as claimed in claim 1 or 2, characterized in that buffered images are selected to form image pairs in such a way that the distance covered between the recording times of the images corresponds to a predefined value.

4. The method as claimed in claim 3, characterized in that the predefined value is preferably in the range between 0.2m and 1m, in particular 0.3m.

5. The method as claimed in claim 3 or 4, characterized in that only buffered images during whose recording the orientation of the camera has not changed significantly are selected to form image pairs.

6. The method as claimed in one of claims 1 to 5, characterized in that a sequence of local 3D depth views are accummulated, wherein the image data of the individual local 3D depth views which can be assigned to the same location points in the environment of the vehicle are added to one another.

7. The method as claimed in claim 6, characterized in that the image data is subjected to weighting before the addition.

8. The method as claimed in claim 7, characterized in that the volume which is represented by means of the accummulated 3D depth views is divided into individual volume elements within the scope of the weighting.

9. The method as claimed in claim 8, characterized in that all the volume elements correspond to a predefined uniform volume.

10. The method as claimed in claim 8 or 9, characterized in that the volume elements are stored in a tree structure, in particular in the form of an octree.

11. The method as claimed in one of claims 8 to 10, characterized in that the respective number of pixels within the individual volume elements is assigned to each of these volume elements as a weighting.

12. The method as claimed in claim 11, characterized in that a weighting is determined which corresponds to the average weighting of all the volume elements, this overall weighting forming a threshold value on the basis of which it is decided whether the pixels which are contained in the individual volume elements are taken into account in the further processing, wherein only those pixels at which the volume element assigned to them has a weighting which is equal to or greater than the threshold value are taken into account.

13. The method as claimed in claim 12, characterized in that only those volume elements which contain pixels are used to form the overall weighting.

14. The method as claimed in claim 12 or 13, characterized in that the threshold value is formed by multiplying the overall weighting by a tuning factor.

15. A device for 3D observation and measurement of the lateral environment of a vehicle, mainly for detecting parking spaces, comprising a camera for recording digital images which is connected to a data processing unit by means of which the images are provided with a time stamp and buffered, characterized in that a unit for sensing the vehicle's own movement is provided, and in that a means for selecting image data on the basis of the vehicle's own movement in order to form image pairs is provided, and which is connected to a unit for stereoscopic image processing.

16. The device as claimed in claim 8, characterized in that the unit for sensing the vehicle's own movement is, in particular, a

speedometer, wheel speed meter, navigation system or a vehicle movement dynamics system.

17. The device as claimed in claim 8 or 9, characterized in that the camera preferably has a 90° orientation with respect to the direction of travel.

18. The device as claimed in claim 8 or 9, characterized in that the camera preferably has an orientation of 45° - 135° with respect to the direction of travel.

19. The device as claimed in one of claims 8 to 11, characterized in that the camera is a component of an image recording system which is already located in the vehicle.

20. Use of the device or the process according to one of the preceding claims as warning system, particularly for measuring the distance from the vehicle to the curb.